

REMARKS

New claim 42 depends from claim 1 and recites that the chemical oxidizing agent is a salt. Support for the claim can be found, for example, at page 11 of the present specification. No new matter is added. Upon entry of the Amendment, which is respectfully requested, claims 1-42 will be pending.

Response to Claim Rejections under 35 U.S.C. § 112

At page 7 of the Office Action, claims 22 and 40 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. According to the Examiner, the claims lack a definition for enzyme activity.

Applicants traverse and respectfully request the Examiner to reconsider in view of the following remarks.

In the present invention, the laccase activity was determined using ABTS (2,2'-azino-bis(3-ethylbenzthiazoline-6-sulphonic acid)) as a substrate. The activity of laccase was measured at room temperature using pH 4.5 as the determination pH and expressed in nanokatal (nkat). The SI unit of catalytic activity is defined as the amount of enzyme activity that converts 1 mol of substrate per second in the assay conditions. The specific conditions of each chemical reaction are described in the working examples so that enzyme activity can be calculated in katal for each condition.

In view of the foregoing, a person having ordinary skill in the art would be able to ascertain the definition of enzyme activity with respect to the present invention. The document

by Niku-Paavola et al. [1988]¹ is enclosed herewith to provide evidence of what is known in the art. In the document by Niku-Paavola et al. [1988], laccase activity is calculated in the same way as that of the present invention.

In view of the above, it is respectfully requested that the § 112, second paragraph, of claims 22 and 40 be withdrawn.

Response to Claim Rejections under 35 U.S.C. § 102

Claims 1-6, 9-15, 22-29, 31-34 and 41

At page 8 of the Office Action, claims 1-6, 9-15, 22-29, 31-34 and 41 are rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by U.S. Patent Application Publication No. 2003/0186036 (Goodell).

Applicants traverse and respectfully request the Examiner to reconsider in view of the following remarks.

In order to anticipate a claim under 35 U.S.C. § 102, a reference must disclose within the four corners of the document not only all of the elements claimed but also all of the elements arranged or combined in the same way as recited in the claim. *Net MoneyIn, Inc. v. Verisign, Inc.*, 2008 U.S. App. LEXIS 21827, 1, 27 (Fed. Cir. 2008).

In this case, Goodell fails to disclose a specific example which meets the modifying agent as required in the presently claimed invention. A person having ordinary skill in the art would

¹ Niku-Paavola M-L, Karhunen E, Salola P, Raunio V. Lignolytic enzymes of the white-rot fungus *Phlebia radiata*. Biochem. J. 1988;254: 877-884 is enclosed herewith.

have to pick and choose amongst the various exemplary chelators of Goodell to arrive at one of quercetin and kaempferol. Goodell does not teach all elements of the present claims and can not be said to anticipate the present invention.

Further, Goodell described the oxidation of lignocellulosic materials and organic compounds using hydroxyl radicals that are generated in mediated Fenton reactions. The aim of Goodell is to produce an efficient oxidation achieved with said hydroxyl radicals. The purpose of the mediator of Goodell is to bind metals and then “be reduced back to its reduced form” (page 6, [0093]). These “cycling” mediators are selected from compounds that do not exit the system by binding to a starting material or the product. Instead, the “cycling” mediators are selected from compounds that can be regenerated and reused. Therefore, the redox cycling chelators of Goodell do not expressly or inherently act as modifying agents as required by the presently claimed invention.

Further, even if the mediators of Goodell were to bind to the fibre, they would not provide the fibre with the desired functionalization.

Goodell does not expressly or inherently disclose each and every element of the presently claimed invention, and thus, does not anticipate the presently claimed invention. Accordingly, withdrawal of the § 102 rejection of claims 1-6, 9-15, 22-29, 31-34 and 41 based on Goodell is respectfully requested.

Claims 1-6, 9-14, 23-33 and 41

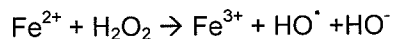
At page 10 of the Office Action, claims 1-6, 9-14, 23-33 and 41 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 6,136,041 (Jaschinski).

Applicants traverse and respectfully request the Examiner to reconsider in view of the following remarks.

The Examiner states that Jaschinski discloses hydrogen peroxide [claim 3]; hydrogen peroxide is the same oxidant as used in the present invention.

In the present invention, the targeted reaction is the coupling of a phenoxy radical of a phenolic species to the fibre surface.

Jaschinski relates to chelator compounds, which can bind to a transition metal catalyst to decompose hydrogen peroxide to hydroxyl radicals according to the scheme:



The activator of the present invention is different from the species used or formed in the above reaction. For example, the APS mentioned as an exemplary oxidizing agent in the present application reacts through a sulphate radical.

In view of the above, it is submitted that the Jaschinski does not anticipate the present invention. Accordingly, withdrawal of the § 102 rejection of claims 1-6, 9-14, 23-33 and 41 based on Jaschinski is respectfully requested.

Claims 1-14, 16-33, 35-39 and 41

At page 12 of the Office Action, claims 1-14, 16-33, 35-39 and 41 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 6,187,136 (Pederson).

Applicants traverse and respectfully request the Examiner to reconsider in view of the following remarks.

The present invention provides a way to functionalize the lignocellulosic fibres which, in turn, provides the fibres with properties foreign to the native fibre. More specifically, in the present invention, the oxidized fibre material is contacted with a modifying agent containing at least one first functional portion, which is compatible with the oxidized fibre material. The modifying agent is capable of providing the lignocellulosic fibre material with properties foreign to the native fibre.

Pederson does not disclose that the modified fiber is polymerized in the presence of an oxidizing agent in such a way that one end of the polymer chain is attached to the primed matrix of the fiber, as recited in the present invention.

Further, Pedersen does not describe the process or the aims of the present invention. The aim of Pederson is to achieve an improvement of the bond strength. Further, Pederson does not disclose a two-step process as disclosed in the present invention.

In view of the above, it is submitted that Pederson fails to anticipate the presently claimed invention. Accordingly, withdrawal of the § 102 rejection of claims 1-14, 16-33, 35-39 and 41 based on Pederson is respectfully requested.

Response to Claim Rejections under 35 U.S.C. § 103

Claims 22 and 40

At page 15 of the Office Action, claims 22 and 40 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as allegedly being obvious over Pederson.

Applicants traverse and respectfully request the Examiner to reconsider in view of the following remarks.

The Examiner's position on this rejection raises the same issues as presented by the § 112, second paragraph, rejection set forth above, and thus, it is respectfully requested that the rejection be withdrawn for the reasons set forth in response to the § 112 rejection.

In particular, in the present invention, the laccase activity was determined as described above, and under the assay conditions at which the enzyme activity was measured, the ranges of Pederson do not overlap with those of the present invention.

Accordingly, withdrawal of the § 102(b) or, in the alternative, § 103(a) rejection of claims 22 and 40 based on Pederson is respectfully requested.

New Claim 42

New claim 42 depends from claim 1 and is patentable at least by virtue of its dependency from claim 1.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.114(c)
U.S. Application No.: 10/583,712

Attorney Docket No.: Q95485

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

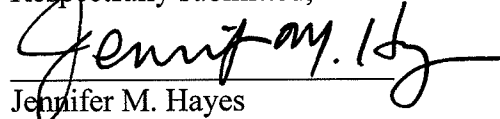
WASHINGTON OFFICE

23373

CUSTOMER NUMBER

Date: August 23, 2010

Respectfully submitted,



Jennifer M. Hayes
Registration No. 40,641